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ABSTRACT

This activity packet offers simple directions for setting up a Morse Code system appropriate to interfacing with any of several personal computer systems. Worksheets are also included to facilitate teaching Morse Code to persons with visual or other disabilities including blindness, as it is argued that the code is best learned auditorily. (PB)

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Morse Code Activity Packet

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Introduction to Morse Code

Morse Code was originally developed in 1853 by Samuel Morse. It was ued to transmit messages over telegraph lines. Today Morse Code is primarily used by ham radio operators, however, the code is gaining new popularity as an efficient computer input method for switch users.

The standard Morse code method uses a single switch to control the duration of sounds. Short sounds (dit) are represented as a dot on paper. Long sounds (dah) are represented as a dash on paper. The combination of dits and dahs are the code that represent letters, numbers, punctuation marks and computer function keys.

The Adaptive Firmware Card or P. C. Aid offer the user some immediate options when using Morse Code. The major options include:

One-switch access or two-switch access

High/low or short/long auditory feedback

Standard code or talking code (IIGS AFC option only)

Simple directions for setting up a Morse Code system are included in this manual. For additional information about choosing the correct option for a specific user, refer to the Adaptive Firmware Card manual.

It is important to remember that it takes time to learn all the codes in the Morse code system. A Morse code user must practice, just as a touch typist must practice.

It is also important to remember that accuracy is more important than speed. Start slow, and with practice both speed and accuracy will improve. (Read information below about auditory learning verses visual learning of the code.)

MORSE CODE: A new perspective

Information obtained at Closing the Gap Conference, 1989.

Several sessions at Closing the Gap featured Morse Code because its use for environmental control and augmentative/alternative communication is expanding. The following are excerpts from two presentations:

Morse Code is more properly known as CW - Continuous Wave. It is a system of binary-encoded pulses which allow transmission of information.

Computers that are adapted to accept CW input, can also convert it into ASCII which can be sent to speech and/or text output.

Functional use of CW is generally taught via a visual chart method, **however, over 100 years of experience and research in telegraphy suggest this may be a major error.**

Reliance on auditory and tactile methods for mastering code, **greatly enhance the speed** of encoding and decoding.

Research and experience confirm that a person learning code visually will reach a top encoding speed of about 12 words (60 characters) per minute, and a top decoding speed of about 10 words per minute (50 characters). It is believed that the slower rate is due to the "extra process" which requires the user to translate the signal into a visual image before encoding or decoding.

Learning code by an auditory method results in encoding and decoding speeds that exceed 20 words per minute (100 characters) and may approach 40-80 words per minute for some people.

When teaching CW auditorily, the student should listen to the code at a normal rate of about 15-20 characters per minute. They however, will begin encoding at about 3 words per minute.

CW is easier to encode when a two-position switch. One side of the switch is the dit. The other side is the dah. However, only one hand should be used to control the switch. Using both hands is exhausting and causes a crossing of the right/left brain which hampers speed and accuracy.

The Adaptive Firmware Card and P.C. Aid allow the user to control the speed and duration of contact with the switch to encode.

CW is a language that is best learned auditorily. Auditory cassette tapes are available for training purposes.

For tactile learners who have difficulty hearing the dits and dahs, cushion a large speaker cone plugged into the CW receiver (or cassette training tape recorder). Turn the volume to maximum and the speaker will vibrate with each dit and dah. The learner can "feel" the CW.

Do not use the terms "dot" and "dash" to represent CW code. Dot and dash refer to visual representations of the code. The correct terms are dit and dah.

Most CW users prefer the Farnsworth method of encoding where character elements are encoded quickly with a pause between words.

CW is most frequently taught by opposites:

common elements (or root)			
	— ·	· —	
	—	— —	— — —

CW is rarely taught in alphabetical order.

Be sure that the student can differentiate between a dit and a dah.

Select MSDOS software programs that translate Morse Code can be used on the network.

Macros can be defined with some software programs to send a string of pre-defined encoded messages.

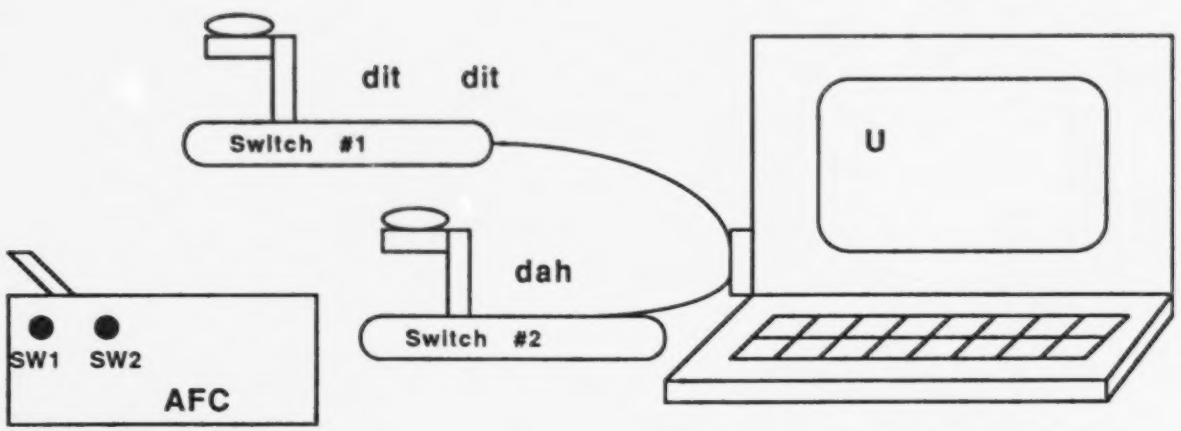
Morse Code
General Directions

Should I Use One or Two Switches?

Morse code is an efficient means of creating text using one or two switches. The system is based on sounds of short and long duration. On paper, the sounds are represented as dots and dashes, but theyare called dits (short signal) and dahs (long signal).

The different combinations of dits and dahs form letters of the alphabet, numbers and punctuation marks. The IIGS AFC has alsocreated codes for special function keys on the computer.

The user may choose one switch or two switches to input Morse code. The major difference between the two methods is that the 2-switch keyer will automatically send a string of dits or dahs of correct duration when you press the correct switch.



Side view of AFC

The 1-switch key produces a constant tone. The user must correctly time the duration of the dit (short) and dah (long) signal. The single switch requires more exact timing and precise motor control.

Morse Code
Directions for Use with Apple II, Adaptive Firmware Card and a switch

SETTING THE ADAPTIVE FIRMWARE CARD

Put a word processing program into the disk drive.

Turn the Adaptive Firmware Card ON.

Select "0" from the Start Up Menu. (O = Standard)

From the Input Menu select the following:

A: INPUT METHOD = 8 *

B: INPUT RATE = 3 +

Press RETURN to load the software into memory.

Follow the directions in the word processing program to open a new file.

Use the enclosed work sheets to provide practice exercises for students.

Keep the Study Guide sheet entitled "ADDITIONAL CODES" next to the computer. Students will need to use this sheet.

* The following are INPUT METHODS used by the Adaptive Firmware Card (AFC):

  8-9 Single switch Morse Code

  10-12 Two switch Morse Code

+ The AFC offers a range in the INPUT METHOD. Start slow and let the student(s) increase speed by ability.

It is recommended that you use the optional tone change that provides auditory feedback to help the student distinguish between the dit and dah.

One-Switch Morse Code on the Apple GS

Plug a switch into SW1 on the Adaptive Firmware Card I/O box.

There are two variations of 1-switch Morse code available:

HIGH/LOW - the tone changes to indicate the difference between a dit and a dah.

PLAIN - a continuous tone (similar to the standard Morse code used by ham operators.)

USING THE IIGS ADAPTIVE FIRMWARE CARD

Get the Choices window on the screen (press ESC twice)

Select MAKE CHANGES IN SETUP

Select METHOD/RATE

Respond Y to the caution window

Set the method to one of the 1-switch methods

Set the rate = 3

After the changes are saved to disk, LOAD the setupand press T to Test the setup.

Two-Switch Morse Code on the Apple GS

Plug a switch into SW1 on the Adaptive Firmware Card I/O box.

Plug a second switch into SW2. (Note: two separate switches or a single, dual action switch can be used.)

There are two variations of 2-switch Morse code available:

HIGH/LOW - Provides an auditory distinction between the dit and the dah.

SHORT/LONG - Makes the dah tone last three times longer than the dit tone.

USING THE IIGS ADAPTIVE FIRMWARE CARD

Boot the AFC Menu Disk.

Move the cursor to the S.MORSE (standard) or T.MORSE (talking) setup. Press Return.

Press Return again to get the CHOICES window on the screen.

Select MAKE CHANGES IN SETUP.

Respond Y to the caution window, then change the method to MORSE 2-SW HIGH/LOW (or SHORT/LONG) and the rate to 3.

When the Choices window reappears, select LOAD the setup.

Press T to Test the setup.

Morse Code International Dictionary

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The Alphabet
International Morse Code

A	•−	K	−•−	U	••−
B	−•••	L	•−••	V	•••−
C	−•−•	M	−−	W	•−−
D	−••	N	−•	X	−••−
E	•	O	−−−	Y	−•−−
F	••−•	P	•−−•	Z	−−••
G	−−•	Q	−−•−		
H	••••	R	•−•		
I	••	S	•••		
J	•−−−	T	−		

Numbers
International Morse Code

1	•▬▬▬▬
2	••▬▬▬
3	•••▬▬
4	••••▬
5	•••••
6	▬••••
7	▬▬•••
8	▬▬▬••
9	▬▬▬▬•
0	▬▬▬▬▬

Morse Code
Additional Codes

Space bar

Backspace

Return (Enter)

Delete

Tab

Open Apple

Escape

Control

Right Arrow

Up Arrow

Down Arrow

Caps Lock

Shift

Period

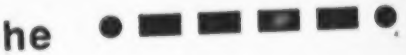
Semicolon

Colon

Comma

Question mark

Apostrophe



Hyphen

Fraction bar

Additional Codes Part 2
Morse Code

Exclamation point !

Dollar sign $

Asterisk *

Plus sign +

Quotation marks "

Open parenthesis (

Close parenthesis)

Underline _____

Ampersand &

Number or pound sign #

Percent %

Open Square Bracket [

Closed Square bracket]

Exponent ^

At @

Less than <

Greater than >

Equal sign =

Most Used Additional Codes
Morse Code

Space bar

Backspace

Return (Enter)

Tab

Escape

Shift

Period

Comma

Question mark

Morse Code
Activity Sheet #1

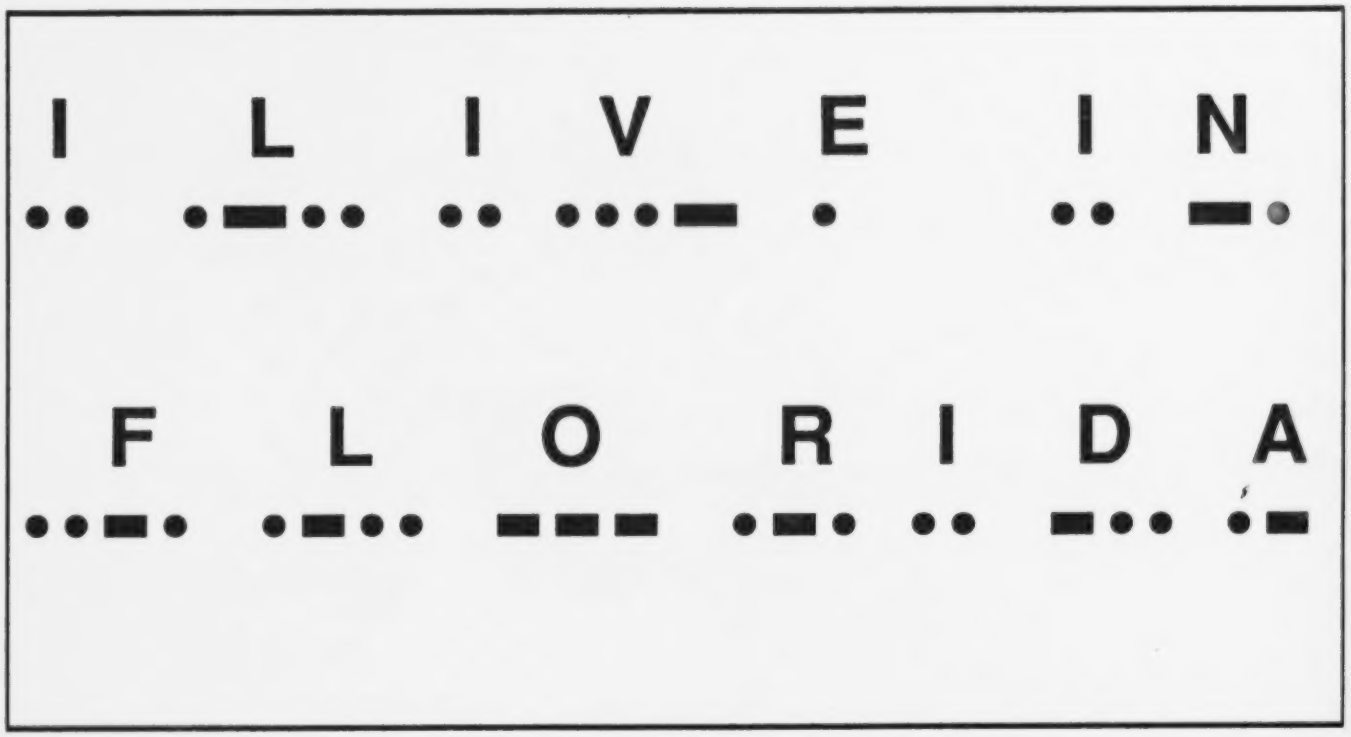
Morse Code

Directions:

Below is a sentence that reads "I live in Florida."

Below each letter in the sentence is Morse code.

Use the teletype switch. Can you type this sentence into the computer using Morse Code?



Morse Code
Activity Sheet #2

Morse Code

Directions:

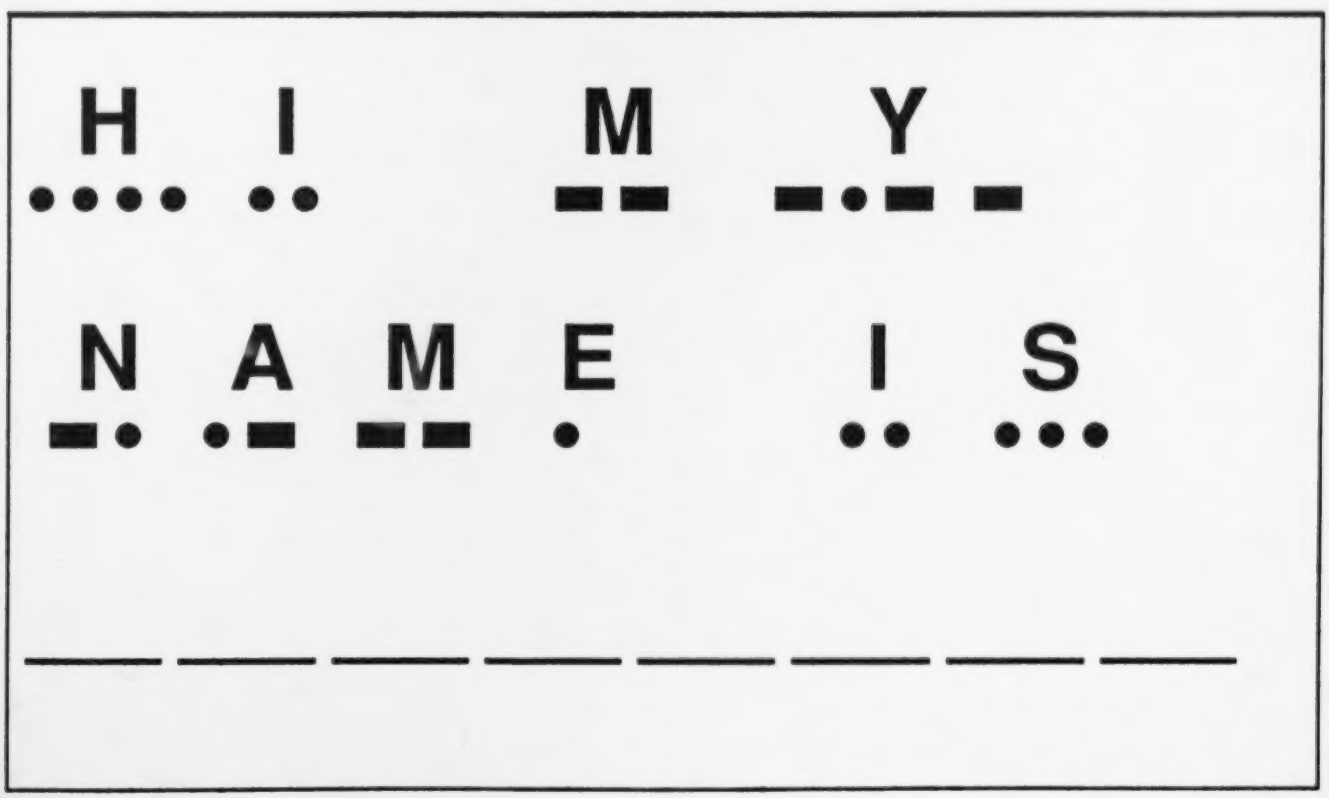
Below is a sentence that reads "Hi, my name is _ _ _ _."

There are 8 blank lines so that you can print your name.

For example, if your name is Sue, the sentence will read, "Hi, my name is Sue _ _ _." Don't worry about the extra lines. They are for people who have more letters in their name.

Below each letter is the Morse code. When you print your name, also print the dots and dashes you need to code the letters in Morse Code. Use the MORSE CODE PICTURE DICTIONARY to code your letters.

When you are finished, use the teletype switch to type the sentence in the computer in Morse Code.



Morse Code
Activity Sheet #3

Morse Code

DIRECTIONS:

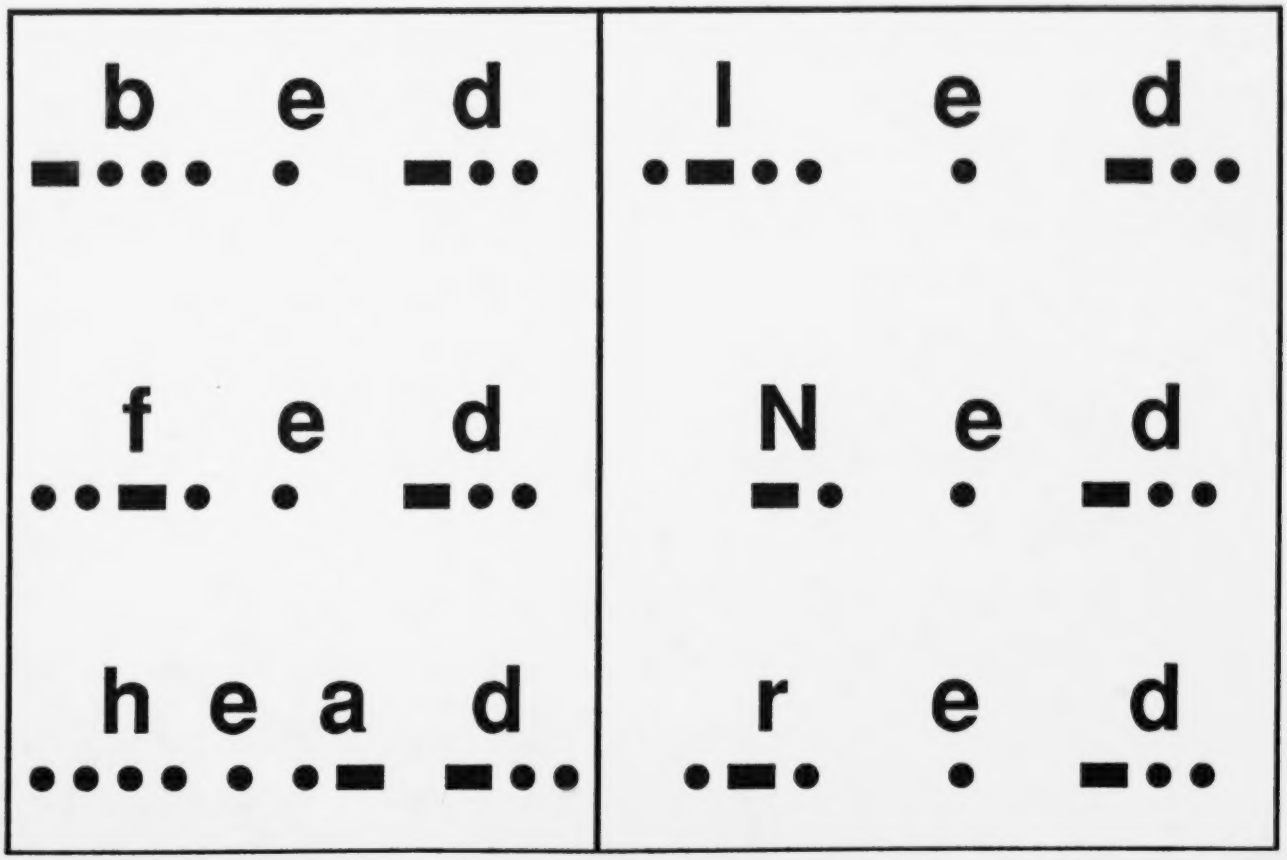
Here are some words that rhyme.

Below the letters of each word is the Morse code.

Practice typing the words into the computer using the Morse Code.

Type each word three times. Did you type faster as you coded the words again and again?

If you practice, Morse Code can be easy!



Morse Code

DIRECTIONS:

Here are some words that rhyme.

Below the letters of each word is the Morse code.

Practice typing the words into the computer using the Morse Code.

Type each word three times. Did you type faster as you coded the words again and again?

If you practice, Morse Code can be easy!

p i n •▬▬• •• ▬•	f i n ••▬• •• ▬•
t i n ▬ •• ▬•	w i n •▬▬ •• ▬•
s i n ••• •• ▬•	L y n n •▬•• ▬•▬▬ ▬• ▬•

Morse Code

DIRECTIONS:

Here are some words that rhyme.

Below the letters of each word is the Morse code.

Practice typing the words into the computer using the Morse Code.

Type each word three times. Did you type faster as you coded the words again and again?

If you practice, Morse Code can be easy!

h e n •••• • −•	K e n −•− • −•
p e n •−−• • −•	d e n −•• • −•
m e n −− • −•	b e e n −••• • • −•

Morse Code

DIRECTIONS:

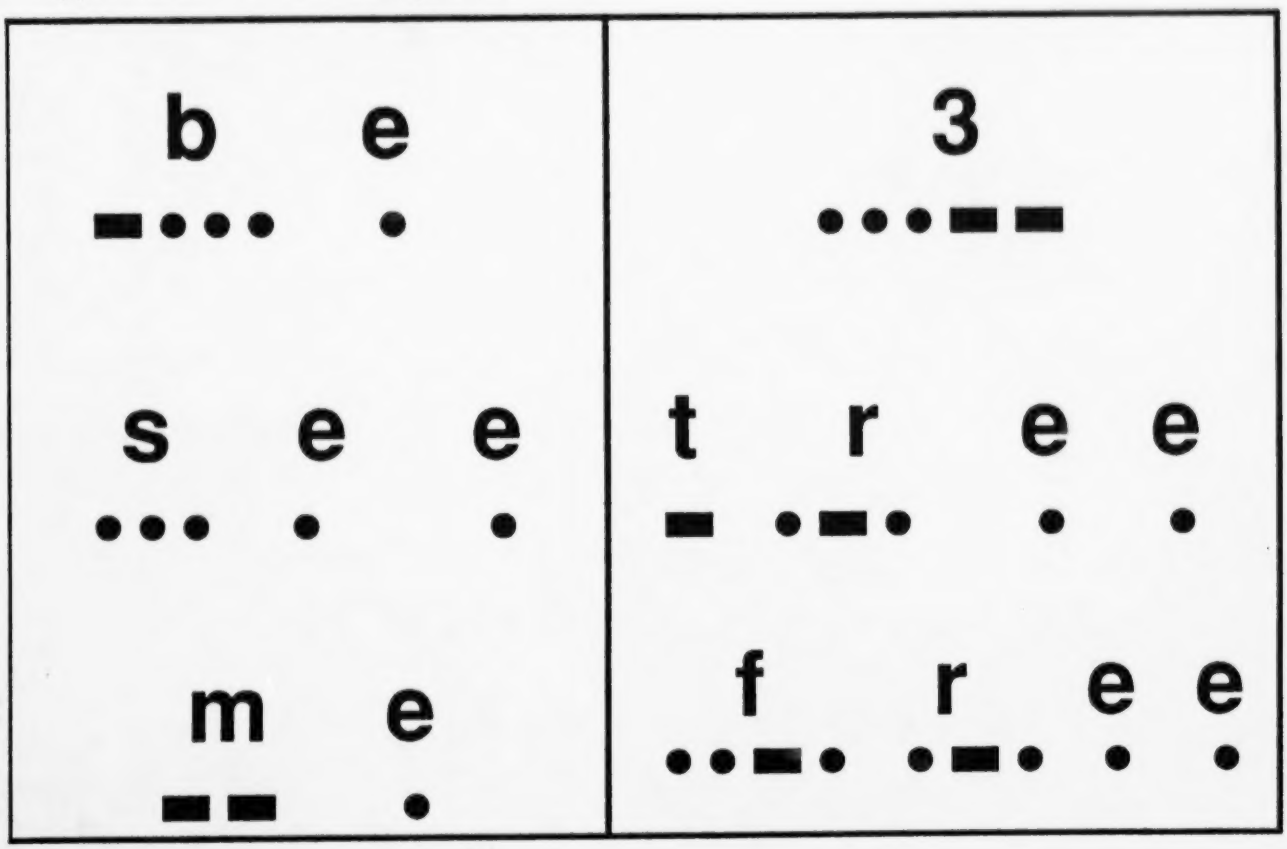
Here are some words that rhyme.

Below the letters of each word is the Morse code.

Practice typing the words into the computer using the Morse Code.

Type each word three times. Did you type faster as you coded the words again and again?

Think of three more words that rhyme with "be". Use the MORSE CODE PICTURE DICTIONARY and code your three rhyming words. Type them in the computer.



Morse Code

DIRECTIONS:

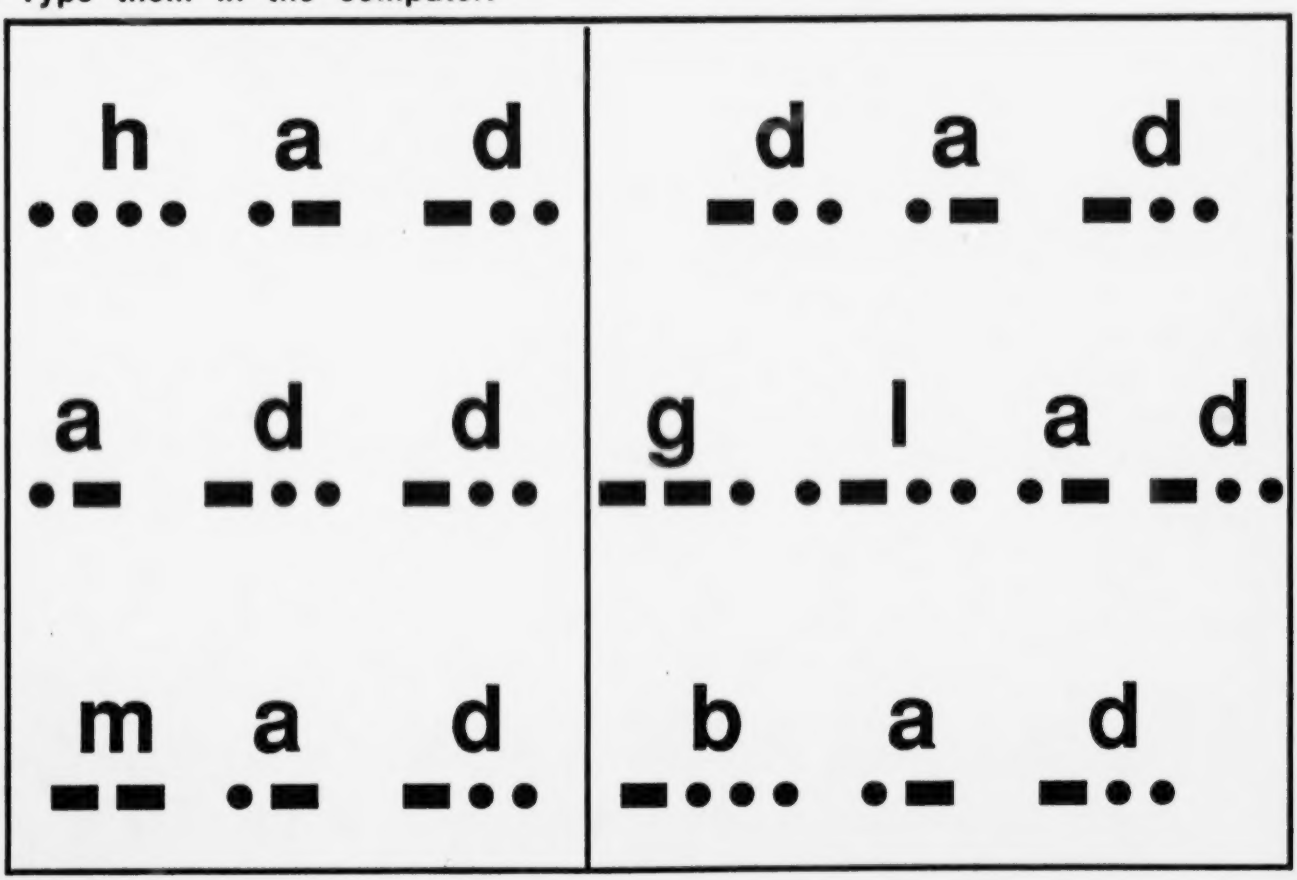
Here are some words that rhyme.

Below the letters of each word is the Morse code.

Practice typing the words into the computer using the Morse Code.

Type each word three times. Did you type faster as you coded the words again and again?

Think of three more words that rhyme with "had". Use the MORSE CODE PICTURE DICTIONARY and code your three rhyming words. Type them in the computer.



Morse Code
Activity Sheet #8

Morse Code

DIRECTIONS:

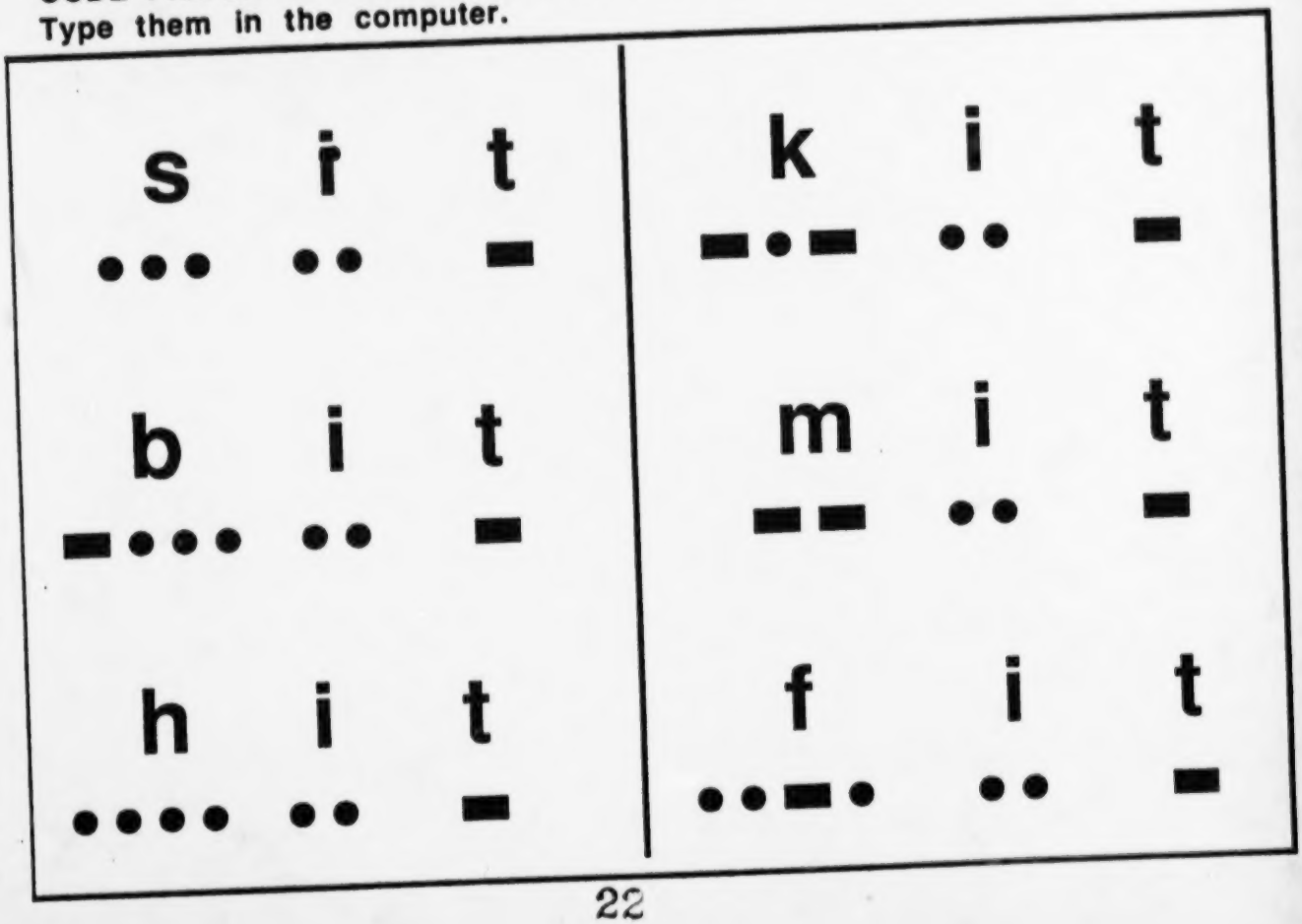
Here are some words that rhyme.

Below the letters of each word is the Morse code.

Practice typing the words into the computer using the Morse Code.

Type each word three times. Did you type faster as you coded the words again and again?

Think of three more words that rhyme with "sit". Use the MORSE CODE PICTURE DICTIONARY and code your three rhyming words. Type them in the computer.



Morse Code
Activity Sheet #9

Morse Code

DIRECTIONS:

Can you think of some words that rhyme with "cat"? Here are a few examples: bat, hat, sat, pat and rat. Write down the other rhyming words you remember.

Select five of the rhyming words and write them in the box below. Use the MORSE CODE PICTURE DICTIONARY to code the letters of each word is Morse code.

Practice typing the words into the computer using Morse Code.

c a t -•-• •- -	____ a t •- -
____ a t •- -	____ a t •- -
____ a t •- -	____ a t •- -

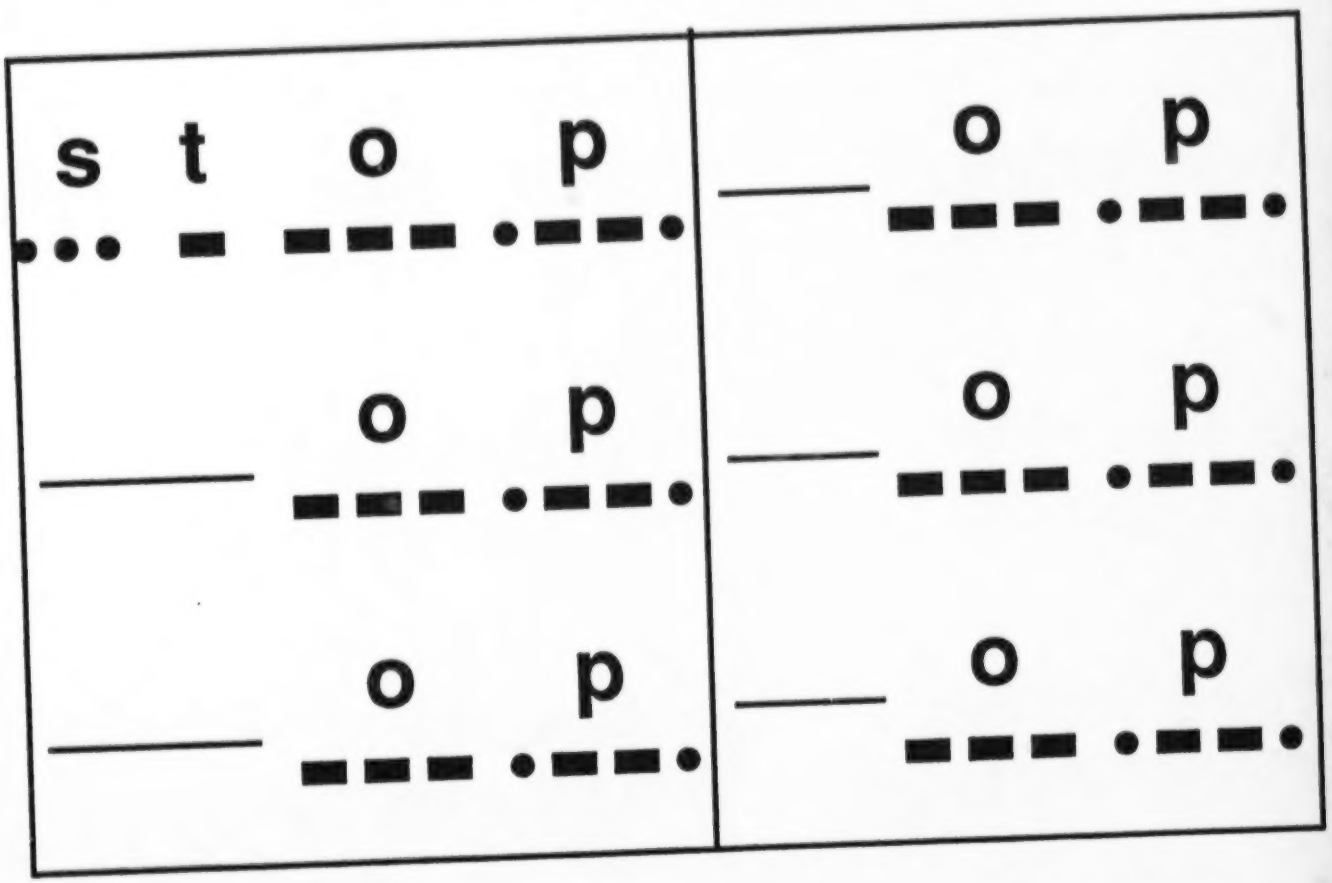
Morse Code

DIRECTIONS:

Can you think of some words that rhyme with "stop"? Here are a few examples: pop, mop, bop, cop and hop. Write down the other rhyming words you remember.

Select five of the rhyming words and write them in the box below. Use the MORSE CODE PICTURE DICTIONARY to code the letters of each word in Morse code.

Practice typing the words into the computer using the Morse Code.



Morse Code
Activity Sheet #11

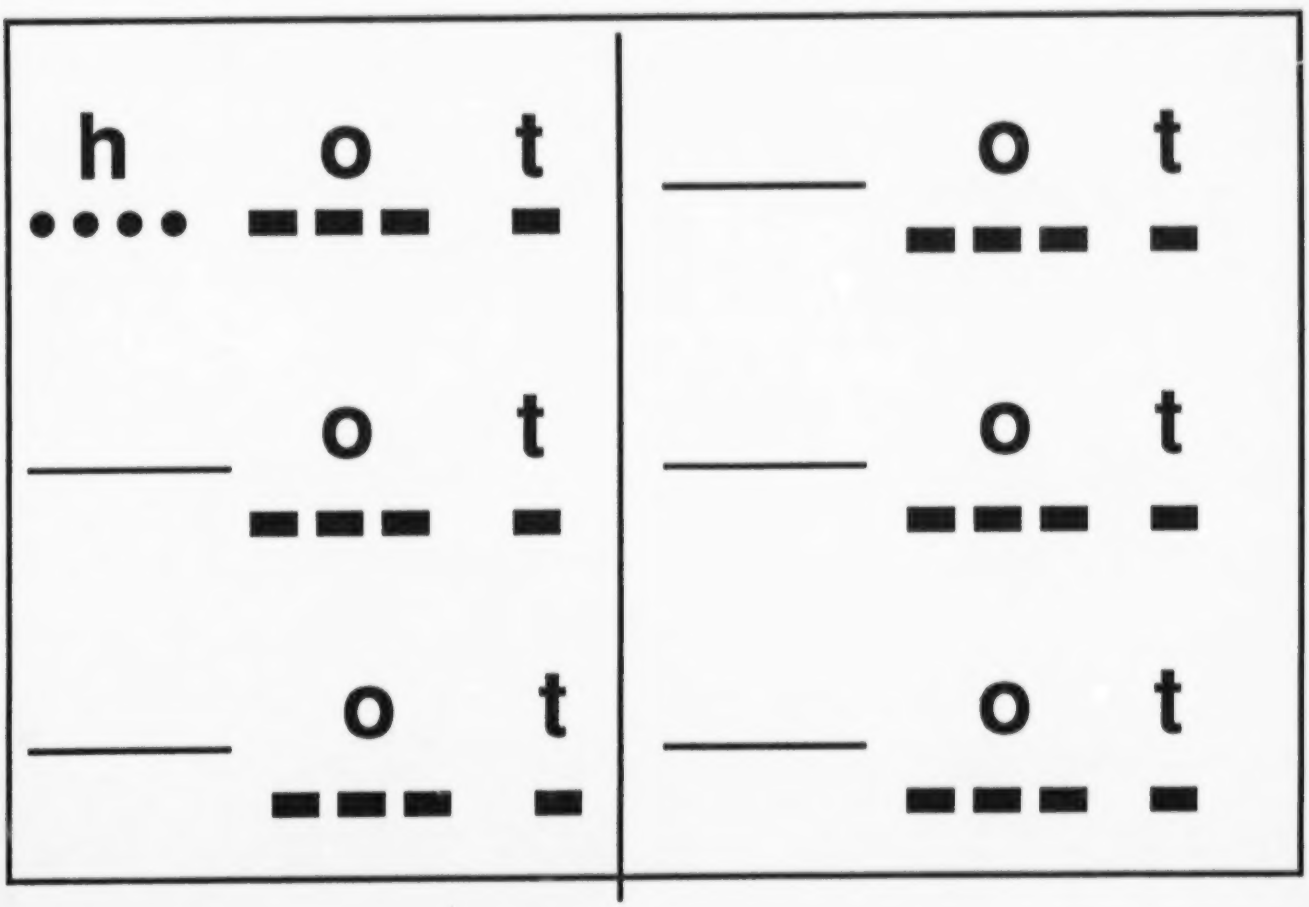
Morse Code

DIRECTIONS:

Can you think of some words that rhyme with "hot"? Here are a few examples: pot, cot, dot, got and lot. Write down the other rhyming words you remember.

Select five of the rhyming words and write them in the box below. Use the MORSE CODE PICTURE DICTIONARY to code the letters of each word in Morse code.

Practice typing the words into the computer using the Morse Code.



Morse Code
Activity Sheet #12

Morse Code

DIRECTIONS:

Can you think of some words that rhyme with "far"? Here are a few examples: pop, mop, bop, cop and hop. Write down the other rhyming words you remember.

Select five of the rhyming words and write them in the box below. Use the MORSE CODE PICTURE DICTIONARY to code the letters of each word in Morse code.

Practice typing the words into the computer using the Morse Code.

f a r ••▬• •▬ •▬•	___ a r •▬ •▬•
___ a r •▬ •▬•	___ a r •▬ •▬•
___ a r •▬ •▬•	___ a r •▬ •▬•

Morse Code
Activity Sheet #13

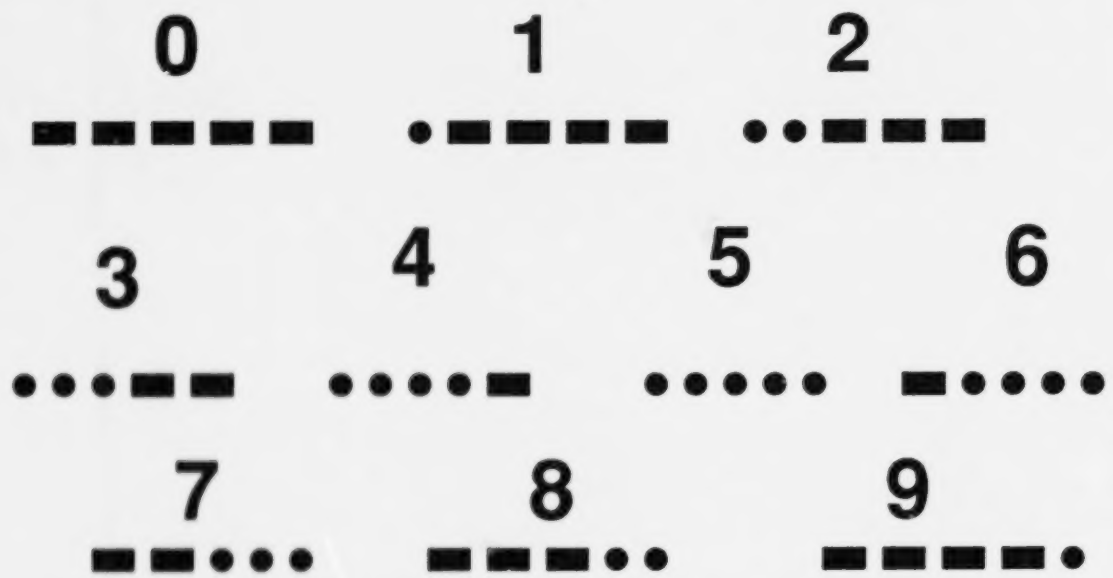
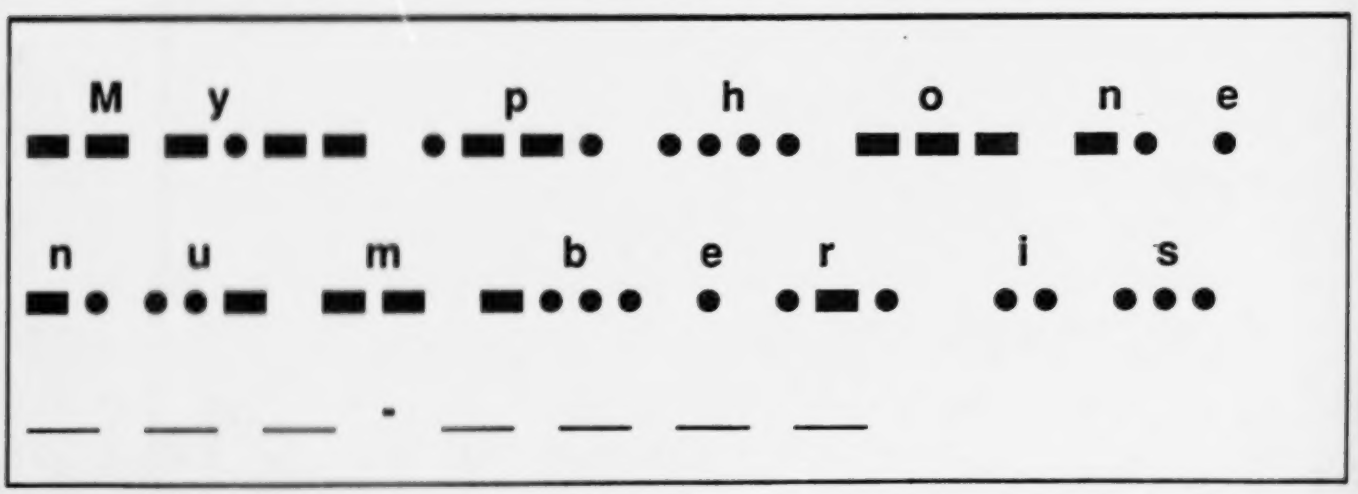
Numbers in Morse Code

DIRECTIONS:

Look at the Morse code for the numbers zero through nine.

Practice typing them into the computer.

Look at the sentence in the box. Fill in your telephone number. Below your telephone number write the Morse Code.

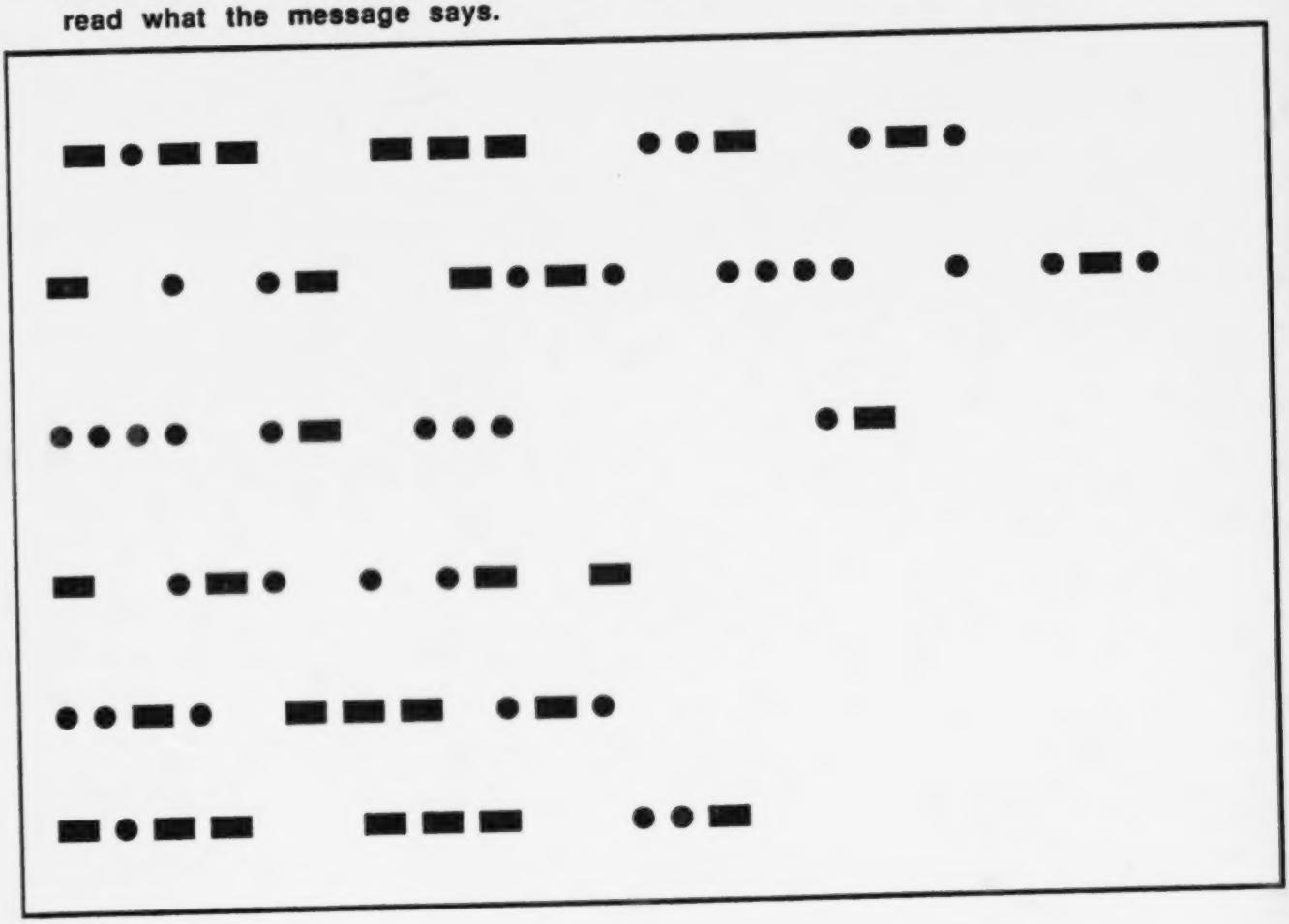
Type the sentence into the computer.



Morse Code
Activity Sheet #14

A MORSE CODE SECRET MESSAGE

DIRECTIONS:

Below is a Morse Code message. Type the code into the computer and read what the message says.



When you have typed the code into the computer, let your teacher see the message on the screen.

Make up your own secret message. Give it to another student to type into the computer. Did the student decode your message correctly?

Morse Code
Activity Sheet #14

A MORSE CODE SECRET MESSAGE

A Note to the teacher:

The Morse Code message in activity #14 reads:

Your teacher has a treat for you.

If you use this activity, it is recommended that you have a small treat ready for the students who complete the activity. M&Ms, popcorn, pencils or some other inexpensive item is suggested. Free-time or computer-time are other "treat" possibilities.

You may wish to substitute your own secret message. Use the Morse Code INTERNATIONAL CHART and code any message you feel is appropriate.

Please note, the teacher needs to "see" the decoded message on the screen. Once a student has typed the message correctly, all the students will know what it says. Hopefully this will provide additional motivation to have them practice Morse Code.